XR TIME SYNCHORNIZATION

14000 SERIES SATELLITE TRANSMITTER

INSTALLATION & USER GUIDE

Doc Part No.: 14000M 082713

Legal Notice

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U.S. Patents 6,873,573; 7,352,657. Other Patents Pending.

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REGULATORY COMPLIANCE

Federal Communications Commission (FCC) / Industry Canada (IC)

License Requirements

- Operation of the Transmitter requires a FCC/IC operating license, which must be obtained prior to operation.
- FCC licenses must be renewed every 10 years and the IC licenses must be renewed annually.
- As a service, Primex Wireless will file the license application if the end-user desires it. An end-user that does not want Primex Wireless to file for the original site license will be required to complete a waiver form, file the required application, and receive a valid license from the FCC/IC prior to use.If you have any questions or need any assistance, please contact Primex Wireless at 1-800-537-0464.
- Primex Wireless requires a copy of the licenses in order to complete the factory presets.

Product Compliance

- This device complies with Part 90 and Part 15 of the FCC rules and RSS-210 of Industry Canada.
- Operation of this device is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference, including interference that may cause undesired operation.

Changes or modifications to any part of the Primex Wireless System components not expressly approved by Primex Wireless could void the user's FCC/IC authority to operate the equipment.

Radio Frequency (RF) Exposure

To comply with FCC/IC RF exposure requirements for mobile transmitting devices, the transmitter is only to be used or installed in locations where there are at least 20cm (approximately eight inches) separation distance between the antenna of the transmitter and all persons.

IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE INSTALLATION, OPERATION, OR MAINTENANCE OF PRODUCT.

Some of the following information may not apply to your particular product model; however, as with any electronic product, precautions should be observed during installation, operation, and maintenance.

- Never operate the transmitter without the antenna being properly connected to the transmitter. Operating the transmitter without an antenna can lead to permanent damage of the transmitter and poses a safety risk.
- Do not touch any of the antennas while broadcasting.
- Standard acceptance procedures must be followed prior to operating this equipment in the proximity of life support systems.
- Do not operate the transmitter outdoors, in wet areas were there is standing water, or in areas where there is condensation or the risk of condensation. Use in any of these environments will damage the transmitter and void the warranty.
- Do not open the transmitter to alter the internal elements in any way. This will void the warranty and could lead to unsafe conditions, malfunction, and violations of FCC/IC regulations.

Primex Wireless disclaims any liability or responsibility for the results of improper or unsafe installation practices.

System Specifications

This section provides the specifications of the XR Time Synchronization system components.

1 Watt Transmitter Specifications

Table 1: 1 Watt Transmitter Specifications

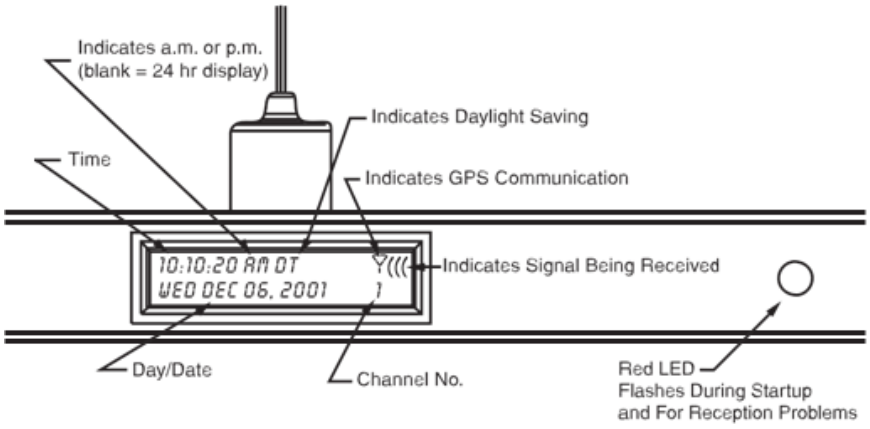
Parameter	Specification
Operating Frequency Range	72MHz
Channels	49 channels available (pre-programmed prior to shipping) Channel 1 through 16 (72.10 - 72.40 MHz) Channel 51 through 74 (72.42 - 72.98 MHz)
Dimensions	17.0" L x 12"W x 1.7"D (43.2cm x 30.5cm c 4.32cm)
Maximum Transmission	1 Watt (at transmitter)
Radio Technology	Narrowband FM
Weight	9lbs
Settings	Time Zone (factory preset), LAN/Local, 30 min offset, serial/USB/Ethernet connectivity
Daylight Saving Time	Bypass switch
Display	Liquid Crystal Display (LCD)
Power Supply	Input: 120 VAC, 50/60 Hz, 0.6 Amp Output: 9 VDC, 2.78 Amp 6' (1.82m) cord
Operating Range	32°-122°F (0°-50°C), non-condensing environment

Canadian Notice: The manufacturer rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

Transmitter Display Specifications

The transmitter has a lighted front display that shows important information.

Figure 1: 14000 Series Transmitter Display



Display Specifications

Table 2: 14000 Transmitter Display Specifications

Component	Description
Time	Displays the precise time received from the GPS Receiver. If AM or PM is on the display, then the 12-hour option is selected. If neither AM nor PM is on the display, then the 24-hour option is selected.
Daylight Saving Time	The letters "DT" (Daylight Saving Time) or "ST" (Standard Time) will be displayed when adjustment for Daylight Saving Time is active. If neither "DT" nor "ST" is displayed, then switch #3 is in the down position and the transmitter will not adjust for Daylight Saving Time.
GPS Communication	The GPS Communication indicator appears when the transmitter is communicating with the GPS Receiver. The parentheses indicate the time signal is being received.
Day/Date	Displays the day and date received from the GPS satellite.
Channel Number	Displays the channel number (1-16) the transmitter is set to.
Red LED	The red LED (Light Emitting Diode) is located on the right side of the front panel of the transmitter. The LED flashes on initial setup until a GPS time signal is received or when a severe GPS Receiver signal problem has occurred and no time data has been received from the GPS Receiver in 48 hours. See the Troubleshooting section of this guide for additional information.

Receiver Switch Specifications

Included with Satellite Transmitter.

Table 3: Receiver Switch Specifications

Component	Description
Cable	5' (1.52m) RS232 cable connects Receiver Switch to the Satellite Transmitter.
Dimensions	5.75" (14.6cm) L x 4.25" (10.8cm) H x 1.25" (3.16cm) D
Antenna	12.5" (31.75cm) L
Weight	0.75 lb (.34kg)
Power Supply	Input: 120 VAC, 50/60 Hz, 0.4 Amp Output: 9 VDC, 0.25 Amp, 6' (1.83m) cord
Operating Range	-32° - 158° F (-36° - 70° C)

INSTALLATION AND CONFIGURATION

This section provides the procedures required to install and configure your 14000 Series Satellite Transmitter system and components.

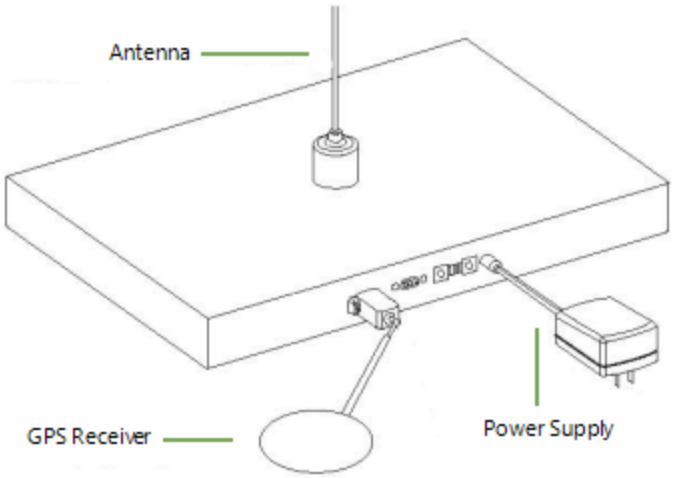
Verify Setup Primary Transmitter with GPS Receiver

Installation of the Satellite Transmitter begins with setup of the primary transmitter with GPS receiver.

- The Primary Transmitter must be setup and working prior to installation of the Satellite Transmitter.
- The Primary Transmitter transmits the signal to the Satellite Transmitter via the Receiver Switch.

> **NOTE:** For the setup and installation of the primary transmitter, refer to the installation guide of the primary transmitter model.

Figure 2: Primary Transmitter Setup Illustration



Satellite Transmitter Location Guidelines

The Satellite Transmitter must be in a location where it can receive a signal from the Primary Transmitter.

Typical Application Drawings

Do not adjust the channel numbers on your transmitter. This figure is an example designed to demonstrate how a repeater switch chain works.

Figure 3: Example of Horizontal Installation

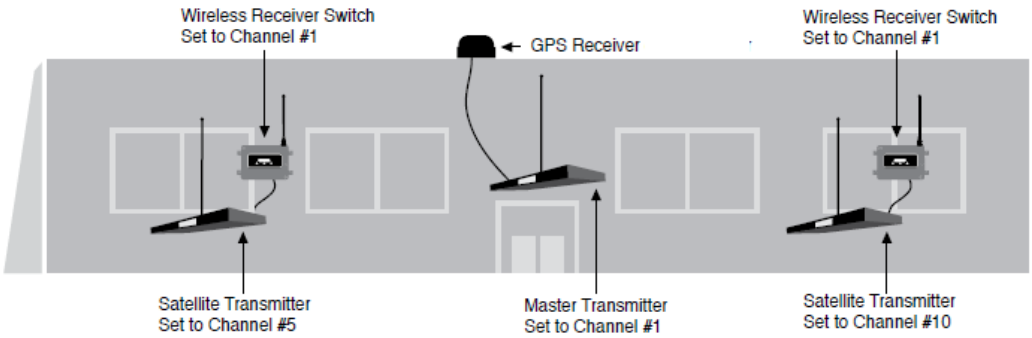
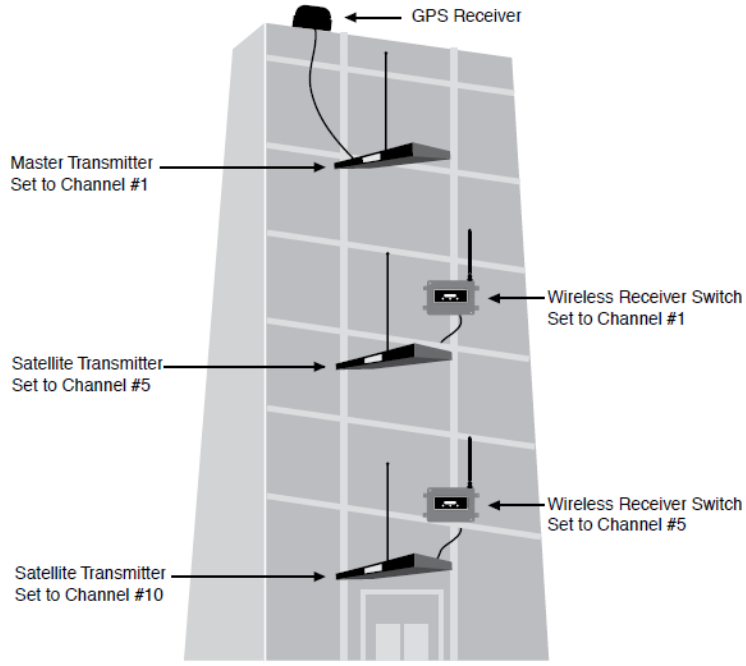


Figure 4: Example of Vertical Installation



Setup the Transmitter

1. Set the switch preferences located on the back of the transmitter The transmitter continually checks the position of the switches. The switches select time zone, channel number, 12- or 24-hour display, and the observance of Daylight Saving Time.

Figure 5: 14000 Transmitter - Back View

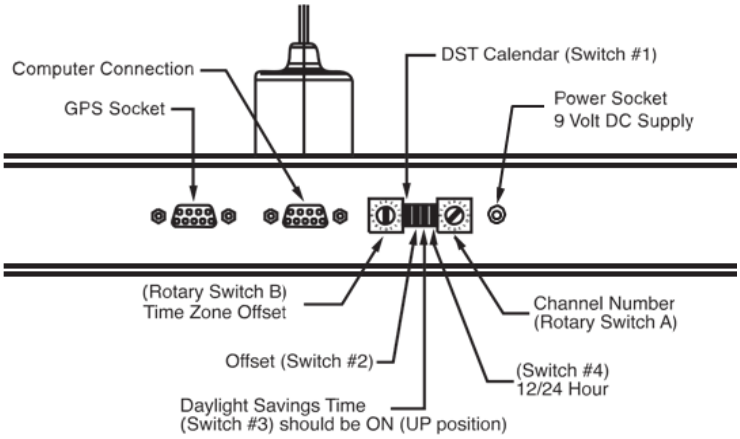


Table 4: 14000 Series Transmitter - Switch/Component Specifications

<table>
<tr><th>Switch/Component</th><th>Description</th></tr>
<tr><td>Rotary Switch A (channel selection)

Warning: Do Not adjust this switch. It is only to be set to the frequency specified on the FCC/IC application.</td><td>Factory preset to the FM frequency on which the transmitter will broadcast.

There are 16 available channels. The chart below explains which switch positions correspond to which channel numbers.

<table>
<tr><th>Switch No.</th><th>Channel No.</th><th>Switch No.</th><th>Channel No.</th></tr>
<tr><td>0</td><td>16</td><td>8</td><td>8</td></tr>
<tr><td>1</td><td>1</td><td>9</td><td>9</td></tr>
<tr><td>2</td><td>2</td><td>A</td><td>10</td></tr>
<tr><td>3</td><td>3</td><td>B</td><td>11</td></tr>
<tr><td>4</td><td>4</td><td>C</td><td>12</td></tr>
<tr><td>5</td><td>5</td><td>D</td><td>13</td></tr>
<tr><td>6</td><td>6</td><td>E</td><td>14</td></tr>
<tr><td>7</td><td>7</td><td>F</td><td>15</td></tr>
</table></td></tr>
<tr><td>Rotary Switch B</td><td>Sets the time zone. Use a small slotted screwdriver to adjust the rotary switch.

“4” for Atlantic Time Zone

“5” for Eastern Time Zone

“6” for Central Time Zone

“7” for Mountain Time Zone

“8” for Pacific Time Zone

“9” for Alaska Time Zone

“A” for Hawaii Time Zone</td></tr>
<tr><td>Switch #1</td><td>Sets the Daylight Saving Time Calendar.

Up to automatically change to the new Daylight Saving Time calendar in 2007.

Down to abide by the old schedule in 2007.</td></tr>
<tr><td>Switch #2</td><td>Sets the direction of UTC offset.

Up for U.S. and Canada

Down for Europe</td></tr>
</table>

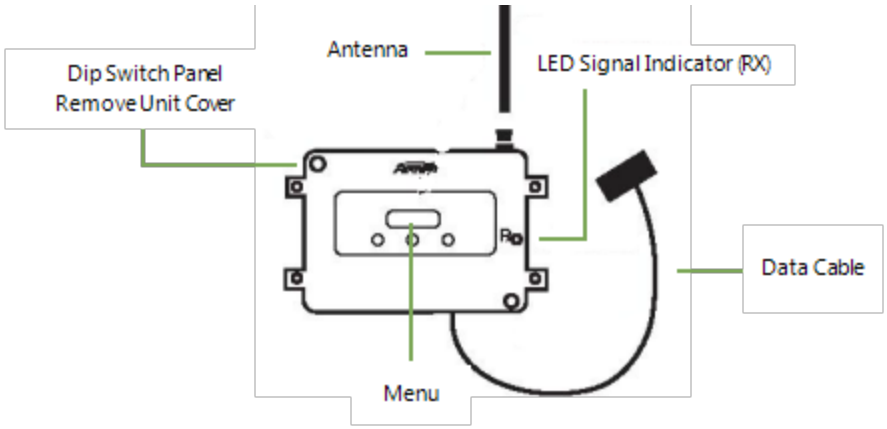
Switch/Component	Description
Switch #3	Sets the automatic Daylight Saving Time adjustment. Up for automatic Daylight Saving Time changes Down to bypass Daylight Saving Time adjustments
Switch #4	Sets the clock display on the transmitter. Up for 12-hour display Down for 24-hour display

2. Plug the supplied 9 Volt 2.0 Amp DC power supply (transformer) into the transmitter.
3. Plug the power supply (transformer) into a 120 VAC outlet.

Setup Receiver Switch

To access the Receiver Switch menu preferences, press the Menu button located on the front of the unit. By pressing and holding the Menu button the Receiver Switch will cycle through the menu options.

Figure 6: Receiver Switch



- While in the Channel menu option, if there are no changes made in a minute of entering a menu section, it will time out and save the displayed value, exiting the menu mode.
- If a value is changed while cycling through the menu, it will be saved and continue to cycle.
- While in test mode, it will remain in the selected mode until the menu button is pressed again to exit.

After entering changes, it is recommended to step through the menu options until the option donE is displayed to exit the menu mode; the menu will display donE.

NOTE: Changes made in the Menu will be saved when the menu is exited.

Table 5: Menu Mode Options Specifications

Display	Menu	Description
Ch	Channel	The Channel Number menu allows the user to change the channel by using the up or down button. The channel number must be set to the same channel number as the Primary Transmitter.
tESt	Test	The Test menu allows the user to hear audible beeps with a valid time/date reception. This will occur 5 seconds after the test menu is selected. It will continue to be in this mode until the menu button is pressed again, leaving the menu mode and returning to normal mode.
LtU	Last Time Update	The Last Time Update menu allows the user to see the last time update, time and date (cycles every second). This will occur 5 seconds after last time update menu is selected. The unit will remain in this mode for a minute, wherein it will time out and return to the menu mode.
Soft	Software Revision:	The Software Revision menu allows the user to see the software revision on the unit. This will occur 5 seconds after last time update menu is selected. The unit will remain in this mode for a minute, wherein it will time out and return to the menu mode.
dst	Daylight Saving Time Calendar	The Daylight Saving Time Calendar menu allows the user to see the current Daylight Saving Time calender in use. This will occur 5 seconds after last time update menu is selected. The unit will remain in this mode for a minute, wherein it will time out and return to the menu mode.
donE	Done	The Done menu allows the user to exit the menu mode. This will occur 5 seconds after the done menu is selected returning to the normal mode saving all settings.

Internal Dip Switch Configuration

The Receiver Switch has an internal dip switch panel that sets the configuration for the time/date display, automatic Daylight Saving Time, and automatic channel scanning.

To access the dip switch panel, remove the unit's large cover. Remove the switch cover by removing the 2 Phillip head screws, located in the upper right and lower right of the unit.The dip switch panel is located on the top of the unit; identified by the blue, eight (8) switch panel.

CAUTION: Except when setting the Dip Switch Options, the unit cover should remain closed and secure at all times.

Table 6: Dip Switch Option Specifications

Switch	Sets	ON Position	OFF Position
2	Time/Date	displays only the time.	displays current time for 8 seconds and the date for 2 seconds.
3	12/24 Hour	displays the time in 24 hour format.	displays the time in 12 hour format.
4	RF Channel Scan	enable the scan and look for a suitable channel.	disable the scan and only look on the selected channel for time/date/event info.
5	Daylight Saving Time - DST	DST is disabled.	DST is enabled.
6, 7, 8	do not apply to the use of this unit.		

Signal Indicator

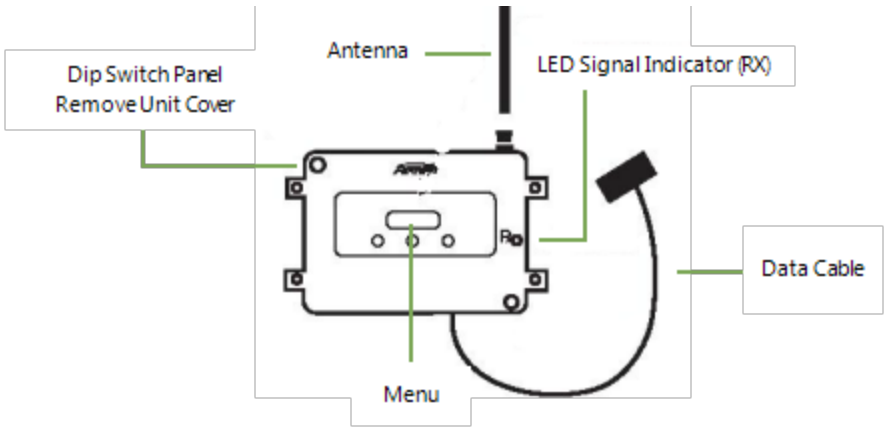
The LED signal indicator (RX) is located on the front right side of the Receiver Switch unit below the antenna.

- Green LED will flash each time a transmitted signal is received by the Receiver Switch from the transmitter at its update time. Green LED will flash for 60 minutes when it has received a valid time update or Green LED will remain solid for 60 minutes if it has NOT received a valid time update.
- Yellow LED will continue to flash if the unit goes 48 hours without receiving a time update.

Install Receiver Switch

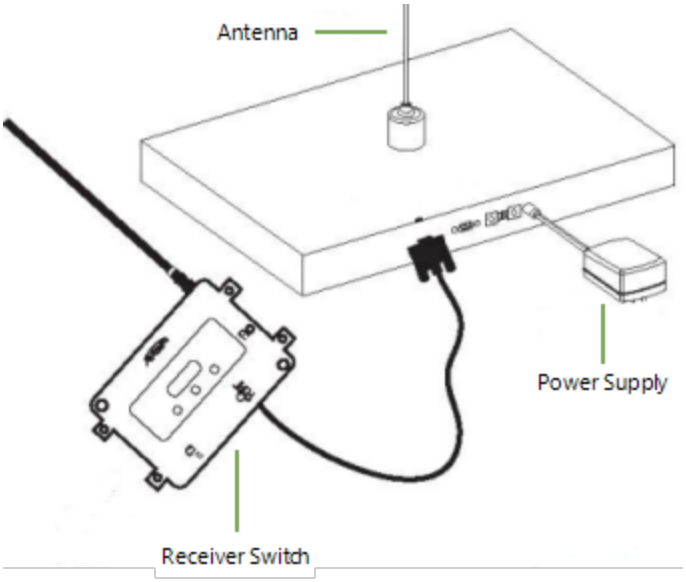
1. Attach the rubber antenna to the Receiver Switch, as shown Figure 7

Figure 7: Receiver Switch



2. Power down the Satellite Transmitter.
3. Connect the serial cable of the Receiver Switch into the GPS IN Socket on the back of the Satellite Transmitter.

Figure 8: Satellite Transmitter - Back View



4. Power up the Satellite Transmitter.
5. Press the **Menu** (middle button) on the front of the unit to scroll through the Menu options to the **Channel Mode** (Ch displayed)
6. Press the up or down button to set the channel number to match the primary transmitter's transmit channel.
7. Scroll through the menu to the **donE** mode. After 5 seconds the Receiver Switch will time-out and return to the Day/Date mode saving the channel selection.
8. Determine the best mounting location for the Receiver Switch.
   a. Locate the room/area the transmitter is to be installed in. Close all doors and windows before testing.
   b. DO NOT hold the rubber antenna during testing, as this can affect the sensitivity of the receiver. Instead, hold the switch by the sides of the housing while locating the best mounting position.

c. Place the Receiver Switch in the EXACT location where it will be mounted. This is crucial as closeness to walls can degrade receiver sensitivity.

   i. If the exact location is not known, be sure to test the Receiver Switch in several locations. If any locations tested are unsuccessful, note this for future reference.

9. Power Cycle the Receiver Switch power at least 1-2 times after installation is complete and verify the green LED begins to flash. Doing this will ensure a solid signal is being received.

   - To cycle power the Receiver Switch, remove the switch cover by removing the 2 Phillip head screws, located in the upper right and lower right of the unit. Use caution when removing the cover to avoid causing the up or down menu buttons to fall off the circuit board.

   - Press and release the **Reset** button, located in the upper right corner to the left of the antenna mounting, 1 to 2 times and verify the green LED begins to flash. The flashing of the green LED indicates a solid signal is being received.

10. Mount the Receiver Switch in its final location and verify the switch settings. For additional information, see "Setup Receiver Switch" located on page 8.

> **NOTE:** When the Receiver Switch is mounted, its antenna must be vertical. Do not use an analog clock to determine if a mounting location will be adequate for signal reception. The receiver in a clock is more sensitive than the Receiver Switch and therefore the switch may not work in areas where a clock works.

Confirm Reception

When the Receiver Switch is connected to the powered Satellite Transmitter, an R will appear in the upper right corner of the transmitter display window. This may take up to a minute. The green RX LED on the Wireless Receiver Switch will flash when a valid signal is initially received. This LED will then flash once per second, signifying a successful time update. If the green LED is solid, the Receiver Switch missed the last update. Time updates occur once per hour.

> **NOTE:** If the Satellite Transmitter does not receive a time update from the Receiver Switch after 48 hours, its yellow "Caution" LED will begin flashing and an error will be logged.

Last Time Update

To verify the last time the Receiver Switch received and applied a valid time/date update toggle through the Menu, to the Last Time Update (LTU) section.

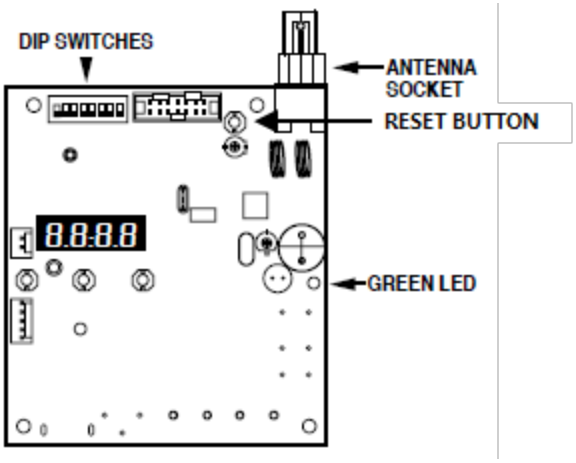
Special Circumstances

For areas that do not observe Daylight Savings Time (DST) set the transmitter's Daylight Saving Bypass reciver switch bypass step below.

> **NOTE:** In the event the receiver switch does not receive a transmitter signal when the DST change is scheduled to occur, the switch will automatically adjust the time on the transmitter. In areas that do not observe DST this feature must be disabled on the circuit board of the switch.

1. Disconnect the receiver switch from the Satellitle Transmitter.
2. On the Receiver Switch remove the access cover and change dip switch #5 to the "ON" position, as shown in Figure 9

Figure 9: Receiver Switch with Cover Removed



Setup Multiple Transmitters Within the Same Facility

1. Setup each Satellite Transmitter and Receiver Switch as per the steps in this guide.
2. The channel number of the Satellite Transmitter is preset to the channel number specified on the red label, located on the top of the box the transmitter was packaged in. Contact Primex Wireless Technical Support if you require assistance.
3. Use the buttons on the Receiver Switch to toggle through to LED menu, and set the channel number to match the XR system channel with the strongest available signal. This signal may be from either the Primary Transmitter or the nearest Satellite Transmitter.
4. Cycle power on the Receiver Switch after changing the channel.

SUPPORT

Technical Support

Prime Wireless Technical Support responds to specific questions about product features, system configuration, and troubleshooting. All support services will be delivered in accordance with your organization's support agreement and warranties.

Contact Technical Support

Before contacting Primex Wireless Technical Support, make sure you have satisfied the system requirements that are listed in your product documentation.

When you contact Technical Support, please have the following information available:

- Customer ID
- Problem description
- Device hardware information
- Error messages
- Troubleshooting performed before contacting Primex Wireless

Technical Support	
Telephone	(800) 404-8112
Email	techsupport@primexinc.com
Fax	(262) 248-0061
Hours	7:00 am to 7:00 pm CST | Monday through Friday
Web	www.primexwireless.com

WARRANTY

One Year Limited Warranty

Primex Corporation warrants this product to be free from defects in materials and workmanship for a standard of one year from the date of purchase. Primex will at its sole option, repair or replace any components that fail in normal use. Such repairs or replacements will be made at no charge to the customer for replacement parts. The customer will be responsible for any transportation costs. This warranty does not cover failures due to misuse, abuse, accidental or unauthorized alterations or repairs.

The warranties and remedies contained herein are exclusive and in lieu of all other warranties express or implied or statutory, including any liability arising under any warranty or merchantability or fitness for a particular purpose, implied, statutory or otherwise. In no event shall Primex be liable for any incidental, special, indirect or consequential damages, whether resulting from the use, misuse or inability to use this product or from defects in the product. Some states do not allow this exclusion or limitation of incidental or consequential damages so the above limitations or exclusion may not apply to you.

To obtain warranty service: If after following the instructions in the product guide, you are certain the product is defective, please contact Primex Wireless Technical Support to assist with troubleshooting the issue. If the issue cannot successfully be resolved and the product is under warranty, an RMA (Return Material Authorization) will be generated. The RMA form will be provided via email with detailed instructions for the return. All merchandise returned must be shipped to Primex Wireless, Attn: Returns Dept., N3211 County Road H, Lake Geneva, WI 53147.

Primex Wireless retains the exclusive right to repair or replace the unit at its sole discretion. All merchandise returned must be shipped to Primex Wireless, Attn: Returns Dept., N3211 County Road H, Lake Geneva, WI 53147. Primex Wireless retains the exclusive right to repair or replace the unit at its sole discretion. Such shall be your sole exclusive remedy for any breach of warranty.